PROVINCE OF ONTARIO.

EXAMINATION PAPERS

FOR

FIRST, SECOND AND THIRD CLASS
PROVINCIAL CERTIFICATES.

JULY, 1878.

105228

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 1.)

ENGLISH LITERATURE.

TIME—TWO HOURS AND A QUARTER.

Examiner—J. M. BUCHAN, M.A.

NOTE.—*The minimum required for pass is 20 per cent. of the marks on each paper, and 40 per cent. of the marks in each group.*

Values.

1. "Hence, should one order disproportion'd grow,
Its double weight must ruin all below.
O then how blind to all that truth requires,
Who think it freedom when a part aspires!
Calm is my soul, nor apt to rise in arms,
Except when fast-approaching danger warms:
But when contending chiefs blockade the throne,
Contracting regal power to stretch their own,
When I behold a factious band agree
To call it freedom when themselves are free,
Each wanton judge new penal statutes draw,
Laws grind the poor, and rich men rule the law;
The wealth of climes, where savage nations roam,
Pillag'd from slaves to purchase slaves at home,
Fear, pity, justice, indignation start,
Tear off reserve, and bare my swelling heart;
'Till half a patriot, half a coward grown,
I fly from petty tyrants to the throne."

Goldsmith, The Traveller, ll. 375-392.

10 *(i.)* Illustrate this passage from the history of Goldsmith's time as fully as you can.

10 *(ii.)* What is the principal thesis maintained in the Traveller, and what the principal thesis in the Deserted Village?

10 2. Write a brief sketch of Goldsmith's life.

10 3. What are the characteristics of his poetical and prose styles?

[OVER.

Values.

4. “ Fir’d at the sound, my genius spreads her wing,
And flies where Britain courts the western spring;
Where lawns extend that scorn Arcadian pride,
And brighter streams than fam’d Hydaspis glide,
There all around the gentlest breezes stray,
There gentle music melts on every spray;
Creation’s mildest charms are there combin’d,
Extremes are only in the master’s mind!
Stern o’er each bosom reason holds her state
With daring aims irregularly great;
Pride in their port, defiance in their eye,
I see the lords of human kind pass by;
Intent on high designs, a thoughtful band,
By forms unfashion’d, fresh from nature’s hand,
Fierce in their native hardiness of soul,
True to imagin’d right, above controul,
While even the peasant boasts these rights to scan,
And learns to venerate himself as man.”

Goldsmith, The Traveller, ll. 317-334.

3 + 3 *(i.)* Write brief notes on ‘Arcadian’ and ‘Hydaspis.’

24, *i.e.* 3×8 *(ii.)* Explain the meaning of ‘scorn,’ l. 319, of l. 322, of l. 324, of ‘state,’ l. 325, of ‘port,’ l. 336, of ‘by forms unfashion’d,’ l. 330, of ‘imagin’d right,’ l. 332, and of ‘boasts these rights to scan,’ l. 333.

3 *(iii.)* Who are meant by ‘the lords of human kind,’ l. 327.

10 5. Describe after Goldsmith the village school-master, introducing quotations where you can.

7 6. Tell what you know about Edmund Burke.

7. “ Ah, no. To distant climes, a dreary scene,
Where half the convex world intrudes between,
Through torrid tracts with fainting steps they go,
Where wild Altama murmurs to their woe.”

Goldsmith, The Deserted Village, ll. 341-344.

3 + 5 *(i.)* What part of the world is meant? Show to what extent the description in ll. 342 and 343 is inaccurate.

2 *(ii.)* What is the meaning of ‘tracts’?

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JULY EXAMINATIONS, 1878.

SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 2.)

ENGLISH GRAMMAR.

Time—Three Hours.

Examiner—J. C. Glashan.

N.B.—*In order to pass, candidates must make at least thirty-six marks on this paper, and at least one hundred and twenty on the group—Grammar, Dictation, and Composition.*

Values.

1. " *Beside* yon straggling fence that skirts the way,
With blossomed furze unprofitably *gay*,
There, in his noisy mansion, *skilled to rule*,
The village master taught his little school;
A man severe he was, and stern to view,
I knew him well, and every truant knew;
Well had the boding tremblers learned to trace,
The day's disasters *in* his morning face;
Full well they laughed with counterfeited glee
At all his jokes, *for many a* joke had he;
Full well the busy whisper circling round,
Conveyed the dismal tidings when he frowned;
Yet he was kind, *or* if *severe* in aught
The love he bore to learning was in fault;
The village *all declared* how *much* he knew;
'Twas certain he could write and cypher too;
Lands he could measure, terms and tides presage,
And *even* the story ran—that he could guage;
In arguing too, the parson owned his skill,
For *even though* vanquished he could argue still;
While words of learned length and thundering sound
Amazed the gazing rustics ranged around,
And still they gazed, and still the wonder grew,
That one small head could carry *all* he knew."

—*The Deserted Village, vv.* 193-216.

[OVER.

Values.

24 (i.) Fully analyse the first ten verses.

42 (ii.) Parse the words in italics.

20 (iii.) Explain the derivation of 'gay,' 'skilled, 'village,' 'boding,' 'disasters,' 'counterfeited,' 'dismal,' 'tidings,' 'kind,' 'parson.'

6 (iv.) Scan lines 10 and 17-21.

3 2. Give examples of adjectives that are rarely or never placed between an article and its noun.

3 What is the position of an adjective attributive to a personal pronoun? Give examples.

3 3. Define a noun, an adjective, a verb.

2+2 Apply your definitions to classify participles and words in the infinitive mood.

4 4. Give examples of the intransitive use of verbs which are usually transitive.

3 What classes of verbs govern two objectives?
4 In the examples—"They crowned him king," "I taught him music"—explain the relation each objective bears to its governing verb.

4 5. Explain the uses of the tenses in the indicative mood.

4 What parts of speech have tense?

6. Divide the following sentences into propositions, and state their kind and connection:—

2 A.—"It is the actual coherence and solidarity of its parts with unity of action, that Mr. Lewes is most concerned to establish."

2 B.—"It is accordingly by another line of argument that Mr. Lewes seeks to establish his position."

4 What does 'it' represent in each sentence?

36 7. Criticise—

"The first and most important kind of public buildings, which we are always sure to want, are schools."—*Ruskin.*

"Samaria, for their sins, is captivated."—2 *Kings, xvii.* Contents.

" A very small number of reminiscences of my own is also added."---*Sir E. H. Rose.*

" Six miles is too far for you to walk."

" But the rose was awake all night for your sake,
Knowing your promise to me;
The lilies and roses were all awake;
They sighed for the dawn and thee."
--*Tennyson.*

" Again their ravening eagle rose
In anger, wheel'd on Europe-shadowing wings,
And barking for the throne of kings."
Do.

" Softly and mild the mountain breeze
Just kiss'd the lake, just stirr'd the trees."
---*Scott.*

" The air smelt sweetly as it does in spring."
The Boy and the Crow.

" After verbs of being and seeming for instance, or their equivalents, the adjective is constantly used."---*Angus,* §312, c.

" The construction is similar to the use of the adjective, as explained in paragraph 312 c.---*Angus,* §311, 4.

" The spelling and pronunciation of the articles, when combined with other letters, may be gathered from the following."---*Angus,* §461. (This sentence *begins* the discussion on the spelling and pronunciation of the articles.)

" The Verb is a word that states or asserts what a thing does or is done to."---*Morris, Primer of English Grammar,* §55.

12 8. Distinguish between---

" You love him better than I:"
and " You love him better than me."

" He stood breathless watching their movements;"
and " He stood breathlessly watching their movements."

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JULY EXAMINATIONS, 1878.

SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 3).

GEOGRAPHY.

TIME—TWO HOURS.

Examiner—JAMES HUGHES.

NOTE.—*The minimum required for pass is* 20 *per cent. of the marks on each paper, and* 40 *per cent. of the marks in each group.*

Values.

4 1. (*a*) Define *Flood* and *Ebb* tides, and *Spring* and *Neap* tides.

2 (*b*) Where does the tide rise to its greatest height ?

4 (*c*) Why does it rise so high there ?

5 2. How do oceanic currents influence climate and navigation ?

16 3. Describe the railroad system of Ontario.

10 4. If a ship was at 160° W. long,, and 20° N. lat., what would be the nearest land ?

10 5. In what countries are the following lakes :—Ladoga, Garda, Constance, Wener, Geneva, Malar, Baikal, Maracaybo, Nicaragua, Victoria ?

20 6. Sketch a map of Asia, and mark the positions of its political divisions, with their capitals ; twelve of its chief rivers ; the chief mountain chains, and capes.

12 7. Give the form of government, religion and chief exports of Switzerland, Russia, Italy, Morocco, China, Persia, Peru, and Brazil.

17 8. Where and what are Susquehanna, Everest, Lyons, Petchora, Antigua, Oporto, Madeira, Boulogne, Milan, Cologne, Clyde, Wash, Solway, Iviza, Skye, Pera, and Euboea ?

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JULY EXAMINATIONS, 1878.

SECOND CLASS TEACHERS AND INTERMEDIATE.

This Paper is not to be seen by the Candidates.

(No. 4.)

DICTATION.

TIME—ONE HALF-HOUR.

Examiner—G. W. ROSS.

The doorway was surrounded by a broad border of festooning-vine branches and grapes all exquisitely sculptured in *alto relievo.* A Corinthian capital, with a monolithic shaft, is all that remains of the front row of the portico. But the delicate workmanship and decorations of that capital, the rich scroll work of the frieze, and the other beauties of these lovely fragments all proclaim how exquisite the structure in its entireness was. Near this is a smaller temple, where fragments of fluted columns are still standing, and at a little distance to the south-east a mausoleum, with a portico still perfect, formed by six columns, all monoliths, and exquisitely proportional, enhances the beauty of the spot. The ruin is unutterable—columns and colonnades, porticoes and temples, mouldering capitals and shivered shafts, triumphal arches and monuments of the illustrious forgotten—all in architecture that can indicate man's mingled littleness and greatness, there meet the eye of the visitor.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 5.)

ARITHMETIC.

TIME—THREE HOURS.

Examiner—J. A. McLELLAN, LL.D.

NOTE.—*The minimum required to pass is 20 per cent. of the marks on each paper, and 40 per cent. of the marks in each group.*

Values.

4 1. From 78004 take 29073, explaining clearly every step of the process.

4 Multiply 5931 by 427, and then divide the product by 5931, showing that the latter process is the converse of the former.

3 2. What is a *composite number?* a *prime number?* when are two numbers *prime to each other?*

6 Of all the numbers, besides unity, that may be substracted from 18445 an exact number of times, which may be taken the *greatest*, and which the *least* number of times?

11 3. Show that the value of a fraction is not altered by multiplying both terms by the same number.

Simplify $$\frac{\sqrt[3]{5.12}+\sqrt[3]{0.03375}}{\sqrt[3]{80}-\sqrt[3]{0.01}}$$

9 4. A room is 24 ft. 6 in. long, 18 ft. 3 in. wide, and 11 ft. 9 in. high, how many yards of paper 27 inches wide would be required to cover its walls?

9 5. If 2 lbs. of tea were worth 3 lbs. of coffee, and 4 lbs. of coffee worth 21 lbs. of cocoa, and 7 lbs. of cocoa worth 9 lbs. of sugar, and 20 lbs. of sugar worth $4\frac{2}{3}$ lbs. of raisins, how many lbs. of raisins would be worth 30 lbs. of tea?

[OVER.

Values.

10 6. A person discounts a note due in 15 months, so as to make 10 per cent. per annum on his money, what rate per cent. on the face of the note does he exact?

5 7. Extract the square root of six million seven hundred and eighty thousand eight hundred and sixteen ten-billionths.

7 An estate which has been surveyed is 400,000,000 times as large as the map of it which has been made; express the linear scale of the map in terms of an inch to a mile.
inches

10 8. A rectangular solid 10 ft. long and 8 ft. broad weighs $4\frac{1}{2}$ tons, and a cubic inch of the same material weighs 2 oz.; find the depth of the solid.

12 9. A certain metal weighs 480 lbs. per cubic foot, and is worth \$50.40 per ton (2000 lbs.), what will be the cost of a quantity of the metal sufficient to make a mile of piping of 9-inch bore and $\frac{3}{8}$ of an inch thick? (Use $3\frac{1}{7}$ as ratio of the circumference of a circle to its diameter).

10 10. Two circular plates of gold, each an inch thick, the diameters of which are 9 inches and 12 inches respectively, are melted into a single plate $\frac{1}{2}$ an inch in thickness. Find its diameter.

JULY EXAMINATIONS, 1878.

SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 6.)

HISTORY.

Time—Two Hours and a Half.

Examiner—S. Arthur Marling, M.A.

Note.—*The minimum required for pass is 20 per cent. of the marks on each paper, and 40 per cent. of the marks in each group.*

1. Describe briefly the origin and growth of the British House of Commons.

2. "The infirm title of the Lancastrian princes, though supported by the consent of the country and backed by the great talents and brilliant victories of the second monarch, was, in that early age, a source of such weakness that none of them ever ventured upon any excess of the regal prerogative." In what respect was their title weak? What are the "brilliant victories" here referred to? Give instances of "excess of the regal prerogative."

3. What were the chief difficulties encountered by the Lord Protector Cromwell in administering the government of England?

4. Give some account of the attempts that were made to restore James II. to the throne.

5. Tell what you know of the Jacobites, the Non-jurors, the Act of Settlement.

6. In what way did England become engaged in the war of the Spanish Succession? Describe the part she took in it.

7. "The Whigs of the Revolution were fortunate in being able to show on their side some of the chief names of the age." When did the terms "Whig" and "Tory" first come into use? What was their origin? What persons are alluded to in the above extract from the text book, and what are their principal works?

[OVER.

8. Write short explanatory notes on Servius Tullius; the Roman Plebs; the Defeat of Regulus.

9. What was the first Roman Province? How did it become a Province?

10. Tell concisely what you know about the invasion of Canada in 1812.

Values—Ten each.

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SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 7.)

ALGEBRA.

TIME—TWO HOURS AND A HALF.

Examiner—J. A. McLELLAN, LL.D.

NOTE.—*The minimum required for pass is 20 per cent. of the marks on each paper, and 40 per cent. of the marks in each group.*

Values.

5 1. Multiply $a^2+b^2-c^2+2ab$ by $a^2-b^2+c^2+2ac$, and divide the product by $a^2-b^2-c^2+2bc$.

8 2. Simplify

$$\frac{18a^2b^2}{x+y} \div \left\{ \frac{3ab(x-y)}{7(c+d)} \div \left(\frac{4(c-d)}{21\,ab^2} \div \frac{8(c^2-d^2)}{a(x^2-y^2)} \right) \right\}$$

3 3. Find the *L.C.M* of $4x^2-9y^2$, $4x^2-12xy+6y^2$, and
6 $6x^2-13xy+6y^2$, and the *G.C.M* of $1+x^{\frac{1}{2}}+x+x^{\frac{3}{2}}$ and $2x+2x^{\frac{3}{2}}+3x^2+3x^{\frac{5}{2}}$.

6 4, Obtain the square root of
7 $\frac{1}{2}-\frac{2}{3}\sqrt{\frac{1}{2}}$, and find the value of c when $4x^4-12x^3y+cx^2y^2-12xy^3+4y^4$ is a perfect square.

3 5. Distinguish between an *equation* and an *identity*. Give an example of each. What value of m makes
5 $(x-3)^2-(x-1)(x-5)=m$ an identity? Can any value of m make it an equation?

8 6. Reduce to its simplest form

$$\frac{\sqrt{2+x}-\sqrt{1+x}}{\sqrt{1+x}-\sqrt{x}} \div \frac{1+\sqrt{1-1\div(1+x)}}{1+\sqrt{1+1\div(1+x)}}$$

[OVER.

Values.

7. Solve the equations—

5 (1) $\frac{2x+5}{x+2}+\frac{2x-5}{x-2}-\frac{4x-5}{x-1}=0$

5 (2) $\frac{a}{\sqrt{x}+\sqrt{a}}=\frac{a}{\sqrt{x}-\sqrt{a}}+\sqrt{a}$

6 (3) $73y-5x=(x-5y)(x+3y)$
$\frac{2}{x-5y}-\frac{5}{x+3y}=\frac{7}{33}$

10 8. A person performed a journey of $22\frac{1}{2}$ miles, partly by carriage, at 10 miles an hour, and partly by train, at 36 miles an hour, and the remainder by walking at 4 miles an hour. He did the whole in 1 hour 50 minutes. Had he walked the first portion, and performed the last by carriage, it would have taken him 2 hours $30\frac{1}{2}$ minutes. Find the respective distances by carriage, train and walking.

4 9. Solve (1) $ax^2+bx+c=0$.

6 (2) $\frac{x+3}{x+4}-\frac{x+1}{x+2}=\frac{4x+9}{2x+7}-\frac{12x+17}{6x+16}$.

5 10. What value of y will make $2x^2+3xy+6y^2$ exactly divisible by $x-3$?

9 If a and b are the roots of the equation $x^2+x+1=0$, show that $a^3-b^3=0$.

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JULY EXAMINATIONS, 1878.

SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 8.)

NATURAL PHILOSOPHY.

TIME--TWO HOURS AND A HALF.

Examiner.—J. C. GLASHAN.

N.B.—*Candidates, in order to pass, must make at least* 22 *marks on this paper, and at least* 120 *marks on the group—Natural Philosophy, Chemistry, and Book-keeping.*

Values.

3 1. *(a)* What are the conditions that two forces acting on a body may produce no effect?

5 *(b)* What are the conditions for three forces so acting?

5 *(c)* Show by a diagram how to arrange pressure of 3 lbs., 4 lbs., and 7 lbs., so that they may be in equilibrium. (The pressures must not be taken acting in the same straight line.)

5 *(d)* Similarly show how to arrange pressures of 5 lbs., 12 lbs., and 13 lbs., to be in equilibrium.

10 *(e)* In like manner show how to arrange pressures of 3 lbs., 4 lbs., 12 lbs., and 13 lbs. to produce equilibrium.

3 2. *(a)* What is meant by the moment of a force?

5 *(b)* How can moments be represented if forces are represented by straight lines?

10 *(c)* Find the resultant in magnitude and position of four pressures, of 1, 2, 3, and 4 lbs. respectively, acting in the plane of a square at its angles and parallel to one of its diagonals, the length of a side of the square being 10 ins.

[OVER.

Values.

5 3. Define the term "*centre of gravity.*"

10, 10 Two heavy spheres, whose diameters are 4 and $3\frac{1}{2}$ inches respectively, are suspended from the opposite extremeties of a horizontal straight rod 4 feet 9 inches long. How far from the extremity to which the larger sphere is attached must the rod be supported for the spheres to balance, *(a)* if the rod is weightless, *(b)* if the weight of the rod is $\frac{6}{7}$ that of the spheres together?

5 4. Enunciate the principle of virtual velocities.

10 *(a)* Show by the principle of virtual velocities that a pressure of 369 lbs. applied parallel to the base of a smooth plane 41 feet long and rising 9 feet will keep in equilibrium a weight of 1640 lbs. resting on the plane.

5 5. State the law of the tensions of the parts of a perfectly flexible weightless cord passing around one or more smooth pulleys.

10 *(a)* A man stands in a bucket suspended from a system of pulleys in two blocks; the upper block (fixed) contains three sheaves, the lower (movable) contains two sheaves. If the man weigh 160 lbs., the bucket 40 lbs., and the lower block 10 lbs., with what force will the man have to pull on the rope to keep himself suspended in mid-air, the rope, as it passes from one block to the other, being vertical?

5 6. Show how to determine the specific gravity of a solid by weighing it in air and in water.

10 *(a)* Forty pounds of gold, specific gravity 17.5, are coined into 1869 sovereigns, how many grains will a sovereign weigh in water?

10 7. A square board floating in water descends one-third of an inch when a weight of 10 oz. is placed upon it; find the length of an edge of the board, assuming a cubic foot of water to weigh 1000 oz.

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JULY EXAMINATIONS, 1878.

SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 12.)

EUCLID.

TIME—TWO HOURS AND A HALF.

Examiner—J. J. TILLEY.

NOTE.—*The minimum required for pass is 20 per cent. of the marks on each paper, and 40 per cent. of the marks in each group.*

Values.

4 1. Distinguish between *direct* and *indirect* demonstration. What propositions in Euclid, Book I., are proved by the latter method?

4 2. *(a)* If two triangles have the three sides of the one respectively equal to the three sides of the other, must the two triangles be equal in every respect?

(b) If the three angles of the one are respectively equal to the three angles of the other, must the triangles be equal in every respect?

(c) Can the angles of a triangle be changed without changing the length of the sides?

Give reasons in full.

6 3. In prop. ix., Book I., if the equilateral triangle be described on the same side of the joining line as the angle to be bisected, distinguish the cases that will arise, and show wherein the construction fails.

6 4. The greater side of every triangle is opposite to the greater angle.

8 5. Taking the ordinary construction of the preceding proposition, in which AC is the greater side and ABC the greater angle, show that the angle ABD is half the sum of the angles at the base BC, and that the angle CBD is half their difference.

[OVER.

Values.	
10	6. If a straight line fall upon two parallel straight lines it makes the alternate angles equal to one another; and the exterior angle equal to the interior and opposite upon the same side; and likewise the two interior angles upon the same side together equal to two right angles.
8	7. In a right-angled triangle if one of the acute angles be double of the other, the hypothemese will be double the shorter side.
10	8. The complements of the parallelograms which are about the diameter of any parallelogram are equal to each other.
8	9. Let ABCD be a parallelogram and E a point in the diagonal DB. If through E a straight line, KEF, be drawn, parallel to AD, and meeting AB in K and DC in F; and also if MEN be drawn parallel to AB, and meeting AD in M and BC in N, show that the straight line which joins MF is parallel to the straight line which joins KN.
8	10. The straight lines which joins the middle points of the sides taken in order of any quadrilateral form a parallelogram.
10	11. If a straight line be divided into two equal parts and also into two unequal parts; the rectangle contained by the unequal parts together with the square on the line between the points of section, is equal to the square on half the line.
8	12 Show that the rectangle under the sum and difference of two lines is equal to the difference of their squares.
10	13. If a straight line be divided into any two parts, the squares on the whole line and on one of the parts are equal to twice the rectangle contained by the whole and that part, together with the square on the other part.

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SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 13).

COMPOSITION.

TIME--ONE HOUR AND A QUARTER.

Examiner—J. M. BUCHAN, M.A.

NOTE.—*The minimum required for pass is* 20 *per cent. of the marks on each paper, and* 40 *per cent. of the marks in each group.*

Each candidate may choose any one of the following topics :—

1. Rome.
2. " How small, of all that human hearts endure,
   That part which laws or kings can cause or cure."
3. Equatorial Africa.
4. All men are born free and equal.

The value of this paper is 75. The Examiners, when valuing the composition, will take into consideration, among other things,

The formation of the sentences.
The purity of the language employed.
The grammar.
The punctuation.
The spelling and the use of capitals.

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JULY EXAMINATIONS, 1878.

SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 14.)

CHEMISTRY.

TIME—ONE HOUR AND A HALF.

Examiner—J. A. McLELLAN, LL.D.

NOTE.—*The minimum required for pass is 20 per cent. of the marks on each paper, and 40 per cent. of the marks in each group.*

Values.	
10	1. Give the names and atomic weights of the elements represented by the following symbols:—Al, C, Ca, Cu, Fe, Cl, Pb, S, P.
12	2. Explain what occurs in the distillation of water, and how the water is purified by the process. What kind of impurities will remain in the distilled water, and how can they be detected?
13	3. Represent the following statement by means of an equation:—If 100 grams of marble be mixed with 73 grams of hydrochloric acid it will yield 111 grams of calcic chloride, 18 grams of water, and 44 of carbonic anhydride.
15	4. Describe fully the preparation of O from potassic chlorate, representing the reaction by an equation. How much potassic chlorate must be taken to yield 10 lbs. of oxygen?
12	5. Give the properties of hydrogen. Describe the process for obtaining hydrogen which is represented in the equation—$H_2SO_4 + Zn = ZnSO_4 + H_2$.

[OVER.

Values.	
14	6. Explain the chemical relations between chalk, quick lime, and slaked lime; also the preparation of chloride of lime, and the reactions by which that substance evolves chlorine when acted on by sulphuric-acid and when exposed to the air.
10	7. What is the composition of lucifer matches? What purpose does each ingredient serve, and what chemical action occurs when you strike a match?
14	8. A compound, on an analysis, is found to yield the following percentages: — Potassium, 49.95; Nitrogen, 16.45; Oxygen, 37.60. Calculate its formula, and give its name.
10	9. State what experiments you have yourself performed, and describe minutely any one of them.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

SECOND CLASS TEACHERS AND INTERMEDIATE.

(No. 15.)

BOOK-KEEPING.

Time—One Hour and a Quarter.

Examiner—John J. Tilley.

Note.—*The minimum required to pass is 20 per cent. of the marks on each paper, and 40 per cent. of the marks in each group.*

Values.

10 1. (i.) Write a receipt for payment of money on account.

(ii.) Write a Due Bill payable in goods.

(iii.) Write a non-negotiable note.

(iv.) Write a note negotiable by endorsement.

(v.) Write a note negotiable without endorsement.

8 2. In Double Entry Book-keeping how is the present condition and progress of a business shown?

9 3. Define the following:—Stock Account, Cash Account, Balance Account, Representative Account, Draft, Consignee, Resource, Cheque, Proceeds of a Note.

15 4. Arrange the following transactions for posting by Single Entry:—

Feb. 18th—Sold John Welch 8 yards cloth @ 40c, 12 yds. ribbon @ 20c, on which he paid cash $4.

" 19th—Bought from Smith & Co. 200 yds. of flannel @ 25c. (20th)—Received from J. Jones his note at 3 months, in full of account $80.

" 21st—Received from A. Brent, cash, on account, $20. (22nd)—Sold John Toms 15 bbls. flour @$6, and took his note at 60 days for the amount.

[OVER.

Values.

8 5. On the authority of James Wilson's order you charge Wilson with James Jones' account, $80. Give Journal entry for each person interested in the transaction. Double Entry.

10 6. The following entry is found in A. B.'s Ledger, folio No. 125:—

John Smith, Dr.

To balance folio, No, 75, $85.

If this amount is settled by a note to be drawn, name the maker.

Explain the closing of folio 75.

20 7. Give Day-Book entries corresponding to the following:—

(a)	Mdse.	Dr.	$2000	
	Real Estate	"	1200	
	A. B.	"	800	
	To Bills Payable			$ 100
	" R. Meyer			400
	" Stock			3500

(b)	Ontario Bank	Dr.	$ 200	
	Bills Payable	"	100	
	Interest	"	10	
	To Bills Receivable			$ 310

(c)	Shipment to A. Brown	Dr.	$2000	
	A. Brown	"	4500	
	To Mdse.			$4000
	" C. Davis			500
	" Cash			1000
	" Bills Receivable			500
	" Bills Payable			500

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

(No. 16).

COMPOSITION.

Time—One Hour and a Quarter.

Examiner—Geo. W. Ross.

Select one of the following as a theme :—

1. Industry.
2. The Dominion of Canada.
3. Neglected opportunities.

Value—75.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

(No. 17.)

GEOGRAPHY.

Time—Two Hours.

Examiner—James Hughes.

Values	
9	1. Define—Plateau, Crater, Estuary, Delta, The Tropics, Meridians, Equinoxes, Longitude and Cardinal Points.
8	2. Distinguish between the Diurnal and Annual Motion of the Earth, and state the results of each.
12	3. State the estimated extent of *land* on the surface of the Earth, and in each of the Grand Divisions.
15	4. Through what waters would a vessel pass in going from Halifax to Chicago? What would her cargo probably consist of in returning?
20	5. Name the principal rivers of Asia, and the waters into which they flow.
4	6. What continent lies east from Asia?
12	7. Name the principal islands included in Oceania.
30	8. Draw a map of Great Britain, and mark on it the the position of the following:—Sheffield, Glasgow, Bristol, Oxford, Paisley, Leeds, Manchester, Dundee, Portsmouth, Birmingham, The Mersey, The Wash, Ben Nevis, The Severn and Greenwich.
40	9. Where and what are the following:—Valparaiso, Callao, Adrianople, Gothland, Yenikale, Dnieper, Bankok, Saghalin, Luzon, Paramaribo, Blanco, Warsaw, Messina, Guernsay, Tonquin, Socotra, Sofala, Guardafui, Delhi and Soudan.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

(No. 18.)

ARITHMETIC.

TIME—THREE HOURS.

Examiner—J. A. McLELLAN, LL.D.

Values.

3 1. Distinguish the terms *multiple*, *common multiple*, and *least common multiple*.

12 The l.c.m. of 391 and another number is 12121, and the g.c.m. is 23: find the other number.

8 2. Prove that $2\frac{3}{4} \div \frac{3}{5}$ is equal to $2\frac{3}{4} \times \frac{5}{3}$.

14 Simplify $\dfrac{1\frac{7}{9}+8\frac{1}{4}}{7\frac{5}{6}-4\frac{2}{9}} \div \dfrac{2\frac{1}{19}+\frac{7}{38}}{\frac{7}{38}-\frac{7}{76}} \div \dfrac{45\frac{1}{8}}{21\frac{1}{4}}$.

20 3. Divide to 6 decimal places nine million eight hundred and forty thousand and eighteen ten-millionths by one hundred and fifty-nine thousand nine hundred and eighty-two hundred-millionths.

10 4. Define ratio and proportion. Show that when four quantities are in proportion, the product of the extremes is equal to the product of the means.

15 Find a fourth proportional to 767 acres 9 chains 279 yards 4 feet, 208 sq. miles 181 acres 93 yards 4 feet, $1317.

10 5. Find the ratio of the simple interest to the true discount on a sum of money for a given time and rate.

12 The interest on a sum of money is $110, and the discount for the same time and rate is $88: find the sum.

[OVER.

Values.

22 6. How many bricks, 9 inches long, $4\frac{1}{2}$ inches broad, and 4 inches thick, will be required for a wall 60 feet long, 17 feet high, and 4 feet thick, allowing that the mortar increases the bulk of each brick $6\frac{1}{4}$ per cent.

2 7, What is the square of a number? The square root?

10 The square of 10129 is 102596641, find the square of 101293 without going through the operation of squaring.

12 Extract the square root of $.\dot{0}4761\dot{9} \div 1.\dot{1}9047\dot{6}$.

8. A man rows 3 miles down stream in 40 minutes; without the aid of the stream it would take him an hour: how long would it take him to return against the stream?

25 9. A grocer bought a quantity of tea of a certain quality, and one-fourth as much of an inferior kind, the cost of the latter, per pound, being only 80 per cent. of that of the former; he mixes them, and sells the mixture at an advance of 10 per cent. on the cost, per pound, of the finer quality: find his entire gain per cent.

25 10. A man invests a certain sum of money in railway stock selling at 80 and paying 5 per cent. dividends, and 50 per cent. more than that sum in Bank of Commerce stock selling at 120 and paying 8 per cent.; his income from both investments is \$520: find the amount invested in each kind of stock.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

(No. 19).

HISTORY.

TIME--TWO HOURS AND A HALF.

Examiner—J. M. BUCHAN, M.A.

Values.	
20	1. Give Macaulay's view as to the time when the English nation originated, with his reasons for it.
10	2. What great changes took place in the time of the Tudor sovereigns?
20	3. Give an account of the Revolution of 1688.
	4. Tell what you know about the reign of George the Third under the following heads :---
8	(i.) Industrial inventions and improvements.
8	(ii.) Home politics.
8	(iii.) Colonial affairs.
8	(iv.) Foreign affairs.
8	(v.) Progress of knowledge.
8	(vi.) Literature.
	5. Write brief historical notes on
8	King Alfred.
8	Cromwell.
8	Sir Robert Peel.
8	The Habeas Corpus Act.
20	6. What is responsible government? Under what circumstances was it introduced into Canada?

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JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

(No. 20.)

DICTATION.

TIME—HALF AN HOUR.

Examiner—G. W. ROSS.

Numbed by the piercing, freezing air,
And burdened by his game,
The hunter, struggling with despair,
Dragged on his shivering frame;
The rifle he had shouldered late,
Was trailed along, a weary weight;
His pouch was void of food;
The hours were speeding in their flight,
And soon the long, keen winter night
Would wrap the solitude.

Oft did he stoop a listening ear,
Sweep round an anxious eye—
No bark or axe-blow could he hear,
No human trace descry;
His sinuous path by blazes wound
Among trunks grouped in myriads round.
Through naked boughs, between
Whose tangled architecture, fraught
With many a shape grotesquely wrought,
The hemlock's spire was seen.

Value—75.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

(No. 21.)

ENGLISH GRAMMAR AND ETYMOLOGY.

TIME—THREE HOURS.

Examiner—S. ARTHUR MARLING, M.A.

Values.

9 1. Define Gender, Case, Preposition, Complex Sentence, Coördinate Proposition, Inflexion.

18 2. Give the infinitive present, the present participle and the past participle of the *intransitive* verbs corresponding to 'raise,' 'set,' 'lay,' fell;' also the past tense and the present participle of 'prefer,' 'offer,' 'singe,' 'use,' 'die,' 'begin.'

13 3. What is the nominative absolute? Give an instance, and convert your example into a proposition.

20 4. Give examples of the manner in which words may be converted into phrases and propositions, and *vice versâ*.

24 5. Parse the words in italics in the following:—

> In the place *where* the tree falleth there it shall lie.
> That is *just where* I blame you.
> Do you know *where* to find me?
> He asked me *where* I lived and with *whom*.

20 6. Divide the following passage into propositions: state their kind and relation; and analyse each:—"I come now to speak upon what, indeed, I would have gladly avoided, had I not been particularly pointed at for the part I have taken in this bill. It has been said that I likewise am running the race of popularity."

40 7. Parse every word in the first of these two sentences.

20 8. Explain the meaning of the following affixes and give instances of their use: 'hood,' 'dom,' 'et,' 'ard,' 'ry.'

[OVER.

Values.

16 9. Write the possessive singular and plural of sheep, Mary, child; give a list of nouns ending in *f* that do not change it in the plural; and write the plural of cargo, folio, focus, genus, Mussulman, lily, lord mayor.

20 10. Correct any mistakes you detect in the following sentences, giving the rule that is violated in each case :---

(a) You should have went with me.

(b) That needn't make no difference between such old friends as you and me.

(c) Revenge or self-defence were no longer the only causes of hostility.

(d) The less one reads, the more time we have to read it well.

(e) I will be thankful to receive further information.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

(No. 22.)

ALGEBRA.

TIME—TWO HOURS.

Examiner—J. C. GLASHAN.

Values.

10 1. If $a=3$, $b=5$, $c=-9$ and $2s=a+b+c$, find the value of $s(s-a)(s-b)(s-c)$.

10 2. Prove that $a^3\left(\frac{a^3+2b^3}{a^3-b^3}\right)^3+b^3\left(\frac{b^3+2a^3}{b^3-a^3}\right)^3=a^3+b^3$

10 3. Multiply together $\sqrt{p}+\sqrt{q}+\sqrt{r}$, $\sqrt{p}-\sqrt{q}-\sqrt{r}$, $\sqrt{p}-\sqrt{q}+\sqrt{r}$ and $\sqrt{p}+\sqrt{q}-\sqrt{r}$.

10 4. x^3+y^3 is divided by x^3-y^3 and the result is divided by the quotient of $x+y$ by $x-y$, what will be the result if $\frac{1}{2}x=-\frac{3}{4}y$?

8, 8, 9 5. Find two factors each of x^4+x^2+1, x^4+1 and three factors of x^6+1.

6. Solve the equations—

10 (*a*) $\frac{x-3\frac{1}{2}}{2}-\frac{11-x}{4}+\frac{x-16\frac{1}{4}}{5\frac{1}{2}}=0.$

10 (*b*) $\frac{x-3}{6}-\frac{1-2x}{4}+\frac{2-x}{x}-\frac{2x+1}{3}=0.$

15 7. *A* and *B* could do a certain piece of work in 15 days; *B* and *C* could do it in 20 days; in what time could *A* and *C* do it supposing that *A* can do three times as much as *C* in a given time.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

(No. 23.)

EUCLID.

Time—Two Hours.

Examiner—J. J. Tilley.

N.B.—*Fifteen marks to be allowed for each question*, 100 *to be taken as a full paper.*

1. Define Problem, Theorem, Perimeter, Corollary, and Converse Proposition.

2. Give in order the authorities used in the construction of the the following propositions:—II., IX., XII., XXXI., Book I.

3. If one side of a triangle be produced, the exterior angle is greater than either of the interior opposite angles.

4. If from the ends of a side of a triangle two straight lines be drawn to a point within the triangle, these will be less than the other two sides of the triangle, but will contain a greater angle.

5. The complements of the parallelograms which are about the diameter of any parallelogram are equal to each other.

6. If any side of a triangle be produced the exterior angle is equal to the two interior opposite angles, and the three angles of every triangle are together equal to two right angles.

7. Prove, without producing a side, that any two angles of a triangle are together less than two right angles.

8. If the straight line BC meet the straight line AD in the point C, and the straight line CE be drawn bisecting the angle BCD, and the straight line CF be drawn to bisect the angle ACB, prove that the angle FCE is a right angle.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

(No. 24.)

ENGLISH LITERATURE.

Time—Two Hours.

Examiner—J. M. Buchan, M.A.

N.B.—*One hundred and fifty marks will be considered a full paper.*

Values.

1. " I bring fresh showers for the thirsting flowers,
From the seas and the streams;
I bear light shade for the leaves when laid
In their noonday dreams;
From my wings are shaken the dews that waken
The sweet buds every one,
When rocked to rest on their mother's breast,
As she dances about the sun."

Shelley—The Cloud.

8+8 (i.) Explain the statement in ll. 1 and 2, and that in ll. 3 and 4, so as to show that you understand them.

8+8 (ii.) What is the received theory of the formation of dew? What is meant by

"The dews that waken
The sweet buds every one"?

8+8+8 (iii.) What are 'rocked to rest on their mother's breast'? What is meant by 'mother' in 'mother's breast'? and what by 'dances about the sun'?

8 (iv.) Parse 'waken'.

9+6 (v.) Write a brief note on Shelley, and name his chief poetical contemporaries.

[OVER.

2. "Driven off his throne; buffeted by rude hands; with his children in revolt; the darling of his old age killed before him untimely; our Lear hangs over her breathless lips, and cries, 'Cordelia, Cordelia! stay a little!'

'Vex not his ghost!—oh, let him pass!—he hates him much
That would upon the rack of this tough world
Stretch him out longer!'"

Thackeray—Death of George III.

6 (i.) When did George III. die?

7+7 (ii.) What is the historical ground for the statements implied in the clauses

'Driven off his throne,'
'With his children in revolt'?

9+6 (iii.) Tell the story of Lear and Cordelia. Who are meant in this passage by Lear and Cordelia?

6+6+6+8 (iv.) Who is the author of the poetical part of the extract? What is the meaning of 'pass'? Between what two things is a comparison implied in the expression 'rack of this tough world'? Quote a line from Shelley's cloud in which the word 'rack' is used, and explain its sense there.

8 (v.) Name two of Thackeray's competitors in the dedepartment of literature in which he was most eminent.

3. "How sweet the moonlight sleeps upon this bank!
Here will we sit and let the sounds of music
Creep in our ears; soft stillness and the night
Become the touches of sweet harmony.
Sit, Jessica: Look how the floor of heaven
Is thick inlaid with patines of bright gold;
There's not the smallest orb which thou behold'st
But in his motion like an angel sings,
Still quiring to the young-eyed cherubims:
Such harmony is in immortal souls;
But whilst this muddy vesture of decay
Doth grossly close it in, we cannot hear it."

Shakespeare—Merchant of Venice.

Values.	
24, *i.e.* 6 ×4	(i.) Explain the meaning of ‘become,’ l. 4, ‘patines,’ l. 6, ‘muddy vesture of decay,’ l. 11, and ‘grossly,’ l. 12.
7	(ii.) What is the force of ‘still,’ l. 9 ?
10	(iii.) Would it be correct to infer from the expression ‘his motion’ that ‘orb’ is masculine ? Give a reason for your answer.
8	(iv.) Explain clearly what it is that we cannot hear ‘whilst this muddy vesture of decay doth grossly close it in.’
6	(v.) What ancient belief is implied in the expression ‘floor of heaven’ ?
12	(vi.) Tell what you know about Shakespeare.
215	

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

ARITHMETIC.

ANSWERS.

1. 713.
2. $\frac{7}{130}$.
3. 615.070320.
4. $228603.
5. $440.
6. 40960.
7. 10260271849; $\frac{1}{5}$.
8. 2 hours.
9. $14\frac{7}{12}$ per cent.
10. $3200, $4800.

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JULY EXAMINATIONS, 1878.

THIRD CLASS TEACHERS.

ALGEBRA.

Answers.

1. $-81\frac{13}{16}$.

3. $p^2+q^2+r^2-2pq-2qr-2rp$.

4. $2\frac{5}{7}$.

5. $(x^2+x+1)(x^2-x+1)$.
$(x^2+x\sqrt{2}+1)(x^2-x\sqrt{2}+1)$.
$(x^2+x\sqrt{3}+1)(x^2-x\sqrt{3}+1)(x^2+1)$.

6. (a) $x=8$. (b) $x=\frac{24}{25}$.

7. 30 days.

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JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 25.)

COMPOSITION.

TIME—ONE HOUR.

Examiner—GEO. W. ROSS.

Select one of the following as a theme :—

1. Idols.
2. Moral Training.
3. Livingstone, the African explorer.
4. Indian Summer.

Education Department, Ontario

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 26.)

GEOGRAPHY.

TIME—TWO HOURS.

Examiner—JAMES HUGHES.

Values.	
10	1. How are clouds formed?
15	2. Explain the causes and describe the courses of the principal *constant* and *periodical* winds.
15	3. Give a diagram showing the three great currents of the Pacific Ocean.
20	4. What is the general direction of the Isothermal lines in crossing a continent in the northern hemisphere. How do you account for the fact that they are much higher on one side of the continent than on the other.
15	5. Where is the zone of calms? What causes such a zone?
15	6. Is there more of the Earth's surface unexplored north or south of the equator? Why?
12	7. Name and give the height of the highest mountains in Asia, Europe, North America and South America.
8	8. How is the diameter of the Earth's orbit found?
15	9. A ship sails from San Francisco 122°.30″ W. Lon. On a certain day her time is 2.18 when the sun shows it to be twelve o'clock. What is the Longitude of the vessel?

[OVER.

Values.	
25	10. Sketch Europe, and mark the position of the following: Rivers—Volga, Don, Petchora, Vistula, Weser, Rhone. Cities—Saragossa, Gallipoli, St. Malo, Basle, Sedan, Munich, Warsaw. Gulfs—Riga, Taranto, Salonica, Dantzic. Capes—Passero, Ortegal, Spartivento, Naze. Straits—Bonifacio, The Sound, Otranto, Yenikale.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 27.)

PHYSIOLOGY.

TIME—ONE HOUR AND A HALF.

Examiner—JAMES HUGHES.

1. (*a*) Explain the process of Respiration.
   (*b*) About how much air remains in the chest after an ordinary *expiration?*
   (*c*) About how much air does the chest of an average sized man contain after an ordinary inspiration?
   (*d*) What are the *direct* causes of *Asphyxia?*
   (*e*) On what principle does the exchange of gases between the *tidal* and *stationary* air take place in the lungs?

2. Mention the chief sources of loss and gain to the blood, and state what is given or taken by each.

3. Write out at least ten hygienic rules which you would give to your pupils.

4. Describe the ear, and state the formation of each part in producing sound.

5. Why is the brain protected by a strong, inflexible, bony case, and the digestive organs almost wholly by muscular walls?

6. Why does an injury to the spinal chord sometimes produce a loss of motion on one side of the body, and a loss of sensation on the other side?

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 28.)

EUCLID.

TIME—THREE HOURS.

Examiner—J. C. GLASHAN.

N.B.—*Sixty marks to each question; 225 marks to count a full paper.*

1. In any right-angled triangle, the square which is described on the side subtending the right angle, is equal to the squares on the sides containing the right angle.

If through D the middle point of the hypothenuse BC, the straight line DE be drawn at right angles to BC meeting a side AC in E, prove (by the method of the first book) that the rectangle contained by EC, AC is half the square on BC, and that the square on EC is equal to the squares on EA, AB.

2. To divide a straight line into two parts, so that the rectangle contained by the whole line and one of the parts shall be equal to the square on the other part.

To divide a straight line into two parts, so that the rectangle contained by the whole line and one of the parts shall be greater than the rectangle contained by the whole line and the other part, by the rectangle contained by the two parts. (Prove by the method of Euclid.)

3. If from any point without a circle two straight lines be drawn, one of which cuts the circle and the other touches it; the rectangle contained by the whole line which cuts the circle, and the part of it without the circle, shall be equal to the square on the line which touches it.

If a quadrilateral be inscribed in a circle and the opposite sides be produced to meet in E and F, the square on the third diagonal, EF, is equal to the sum of the squares on the two tangents drawn from its extremities; and the tangents from the middle point of the third diagonal are each equal to half that diagonal.

[OVER.

4. If a straight line be drawn parallel to one of the sides of a triangle, it shall cut the other sides or these sides produced, proportionally; and conversely, if the sides, or the sides produced, be cut proportionally, the straight line which joins the points of section shall be parallel to the remaining side of the triangle.

The centre of the circle circumscribed to any triangle, the point of intersection of the straight lines drawn from the angles of the triangle to the middle points of the opposite sides, and the points of intersection of perpendiculars let fall from the angles upon the opposite sides, lie in the same straight line.

5. In a right-angled triangle, if a perpendicular be drawn from the right-angle to the base, the triangles on each side of it are similar to the whole triangle, and to one another.

If through a fixed point a chord be drawn cutting a fixed circle, and tangents be drawn at the points of intersection, these tangents intersect on a fixed straight line.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 29).

EDUCATION.

TIME—TWO HOURS.

Examiner—GEO. W. ROSS.

1. Give rules for inflicting punishment.

2. Discuss the relative value of the Lecture and Catechetical modes of teaching, stating which you prefer and giving reasons.

3. You are preparing a lesson for your class on "case." Give your *preparation* notes.

4. "As that is not true *teaching* which simply pours out before the pupil the treasures of the teacher's knowledge, so that is not true *learning* which merely memorizes and repeats the teacher's words and ideas." —*Dr. Gregory.*

Deduce from the above, and illustrate by two or more examples, the true theory of education.

5. Describe the characteristics of a *good recitation (a)* as to the class, *(b)* as to the teacher.

6. How would you teach the tables of "weights and measures"? With which table would you begin? Give reasons.

7. The Science of Teaching is based upon the natural order in which the mental faculties develop. What is the natural order of the development of the faculties? Discuss the importance of recognising this order, with reference particularly to junior classes.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 30.)

ARITHMETIC.

TIME—THREE HOURS.

Examiner—J. A. McLELLAN, LL.D.

Values

20 1. Show that if a number be divided by 9 it leaves the same remainder as the sum of its digits divided by 9.

8 Multiply 643287 by 462427 in the shortest way you can.

10 2. Prove: $\frac{3}{7}$ of $1 = \frac{1}{7}$ of 3; $\frac{2}{3} \times \frac{4}{5} = \frac{2 \times 4}{3 \times 5}$; $\frac{2}{5} \div \frac{3}{4} = \frac{2 \times 4}{5 \times 3}$

20 Simplify $\left(\frac{\pounds 7\ 5s}{\pounds 14\ 6s} - \frac{\text{2tons 2qrs. 26lb.}}{\text{4tons 1qr. 21lb.}}\right) \div \frac{4\frac{1}{4}}{\frac{23}{28} - \frac{18}{91} - \frac{19}{26}}$.

23 3. Show that a vulgar fraction whose denominator is of the form $2^m \times 5^n$ is reducible to a finite decimal having m or n places of decimals according as m or n is the greater.

28 4. A person travelled from London to Loch Lomond (480 miles) by sea, rail, and coach. The distance by coach was $\frac{1}{3}$ that by rail, and the distance by rail .15 that by sea; the cost of the travel by coach was $\frac{2}{3}$ that by rail, and the cost by rail was $\frac{3}{10}$ that by sea: coach fare being 8 cents a mile, find the cost of the entire journey.

28 5. A man invested .62 of his money in bank stock at 124 paying $8\frac{1}{2}$ per cent. dividends, and the remainder in railway stock at 95 paying 6 per cent. dividends; his income from both sources was $1270: find the amount of each investment.

[OVER.

Values.

30 6. I sold a quantity of Consolidated Bank stock at 105, and invested in railway stock at 95; the railway stock having risen to 98 I sold out, and reinvesting the proceeds in Consolidated Bank stock at 105, found I had gained $300 stock. How much Bank stock had I at first?

30 7. A decimeter is equivalent to 3.937 inches, and a cubic decimeter of water weighs one kilogramme; if a cubic inch of water weighs 252.45 grains, express a kilogramme in pounds (avoirdupois) correct to within one-thousandth part of a pound.

30 8. A retailer marks his goods at three prices, a cash price, a six months' credit price, and a twelve months' credit price; from his twelve months' prices he deducts $12\frac{1}{2}$ per cent. for cash, and $7\frac{1}{2}$ per cent. for six months' credit. His six months' prices are 40 per cent. in advance of the cost price of the goods. Find at how much advance on cost he sells on twelve months' credit, goods which sell for $6.66 cash.

34 9. A youth on coming into his fortune at the age of 21 invests it in a Bank which allows 5 per cent. per annum interest. At the end of each year he withdraws for his expenses a sum equal to $\frac{20}{19}$ of his first year's interest: show that if he lives to the age of 83 he will be penniless; given, $\log 2 = .30103$, $\log 3 = .47712$, $\log 7 = .84510$.

22 10. (1) A hill is to be cut through for a line of railway; a vertical section of it would be an isosceles triangle of height 150 feet and verticle angle 120°. Determine the number of cubic yards of soil to be removed in making a horizontal cutting, supposing the railway to be 40 feet wide, and the sides of the cutting to be perpendicular.

17 (2) The area of a square field is 9 acres 3 roods 8.16 poles. A path 3.9 yards wide is constructed round the sides at a cost of 8 cents per square yard, and the remainder of the field is laid down in turf at a cost of 15 cents per square yard: find the total cost of preparing the field.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 31.)

BOTANY AND AGRICULTURAL CHEMISTRY

TIME—TWO HOURS.

Examiner—J. M. BUCHAN, M.A.

Values.

8+8 1. What chemical elements are present in the tissues of vegetables? Why is it supposed that the carbon of plants is derived from carbonic acid gas and not from other compounds of carbon?

8 2. How does it happen that the leaves of a tree come to contain a much larger proportion of ashes than the wood?

8+8 3. What is protoplasm? In what part of the cell is it found?

27, *i.e.*, 3×9 4. Explain the terms *variety*, *species*, *genus*, *order*, *stomata*, *epidermis*, *corymb*, *placenta*, *carpel*.

8 5. How do cells multiply?

10 6. Give the characters of the Rose Family.

5 7. Of what family is the following a description?

"Herbs, or somewhat shrubby plants, with quadrangular stems, and opposite or sometimes whorled leaves, replete with receptacles of volatile oil. Flowers in *axillary* cymules, rarely solitary. *Corolla bilabiate. Stamens* four, *didynamous*, or only two, one of the pairs being abortive or wanting. Ovary free, deeply four-lobed; the central *style* proceeding from between the lobes. Fruit consisting of four (or fewer) little nuts or achenia, included in the persistent *calyx*. Seeds with little or no *albumen*."

[OVER.

Values.	
24, *i.e.*, 3×8	Explain the words printed in italics.
8	8. How would you return to the soil the phosphoric acid of which it had been deprived by the crops?
8	9. What is the composition of humic acid?
8	10. What other vegetable substances have the same chemical composition as starch?
$4+4+4$	11. What is the name of the distinctive acid of the grape, and what should be the character of the soils chosen for and the manures applied to grape vines?

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 32.)

ENGLISH GRAMMAR AND ETYMOLOGY.

TIME—THREE HOURS.

Examiner—S. ARTHUR MARLING, M.A.

As when the cheerful sun *elamping wide
Glads all the world with his uprising ray,
And woos the widowed earth afresh to pride,
And paints her bosom with the flowery May,
His silent sister steals him quite away,
Wrapped in a sable cloud from mortal eyes;
The hasty stars at noon begin to rise,
And headlong to his early roost the sparrow flies.

But soon as he again dishadowed is,
Restoring the blind world his blemished sight,
As though another day were newly his,
The cozened birds busily take their flight,
And wonder at the shortness of the night:
So Mercy once again herself displays
Out from her sister's cloud, and open lays
Those sunshine looks, whose beams would dim a thousand days.

—*Giles Fletcher.*

1. Point out and explain the rhetorical and grammatical figures in the above passage.

2. Indicate the subordinate propositions, and their several relations.

3. Divest the passage of its poetic dress, and re-write it in prose, in as condensed form as you can.

4. Notice any of the words that are used in a sense different from that which they now commonly bear.

---

*Shining.

[OVER.

5. Explain the meaning of 'widowed earth', 'blemished sight', 'cozened birds', 'newly', 'her sister's cloud', 'would dim a thousand days'.

6. Give the derivation of the words that have Latin roots.

7. Parse the italicized words in the following:—*(a)* 'The power of the world *to come*'. *(b)* 'And none so poor *as do him* reverence'. *(c)* 'I am afraid, *methinks*, to hear you tell it'.

(d) Who would fardels bear,
To grunt and *sweat* under a weary life,
But that the dread of something after death
* * * * * puzzles the will.

(e) The fleet approached the town *as if to force a landing.*

(f) Generally *speaking*, the summers are hotter.

(g) There is no doubt of his *being* a great *statesman.*

(h) *Only* in destroying I find ease
To my relentless thought, and *time* destroyed,
For whom all this was made, all this will soon
Follow.'

(i) *Needs must* I *like* it well.'

8. Explain the derivation of 'proxy', 'esquire', 'leopard,' 'farthing', 'yeoman', 'hence', 'woman', 'alarm', 'dunce', 'tramway', 'craven'. 'miscreant'.

9. Comment on the grammar or style of the following passages. suggesting corrections where necessary:—

(a) "The town contained more than one priest, who, during repeated changes in the discipline and doctrines of the church, had remained constant to nothing but his benefice."

(b) "Each looked to sun, and stream, and plain,
As what they ne'er might see again."

(c) "The obstinate conflict gained for Napoleon what alone he required to wrest their hard-earned successes from the allies—time."

(*d*) No laws are better than the English laws.

(*e*) The French nation is not consoled for the misfortunes which it has endured by the incidental triumph of justice in Italy.

(*f*) If ye had known me, ye should have known my Father also.

(*g*) Against these appointments a very few of extreme views had only ventured to feebly remonstrate.

(*h*) There is in the museum at Oxford a jewel or trinket, said to be Alfred's. Yet the curiosity is not, to a certainty, Alfred's.

(*i*) Take care that the child does not hurt himself.

(*j*) Of the five children in the family the three eldest died before their parents.

10. Distinguish enthusiasm and fanaticism, silent and taciturn, truth and veracity, fatherly and paternal, celebrated and illustrious, politic and political; urbane, civil, courteous and polite, judicial and judicious, blame and reprimand.

11. Write a short note on "tendencies" in the English language.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 33.)

PHYSICS.

TIME—TWO HOURS.

Examiner—J. C. GLASHAN.

N.B.—*Twenty-five marks to each question: one hundred and fifty marks to count a full paper.*

1. Describe briefly the process of filling and graduating a mercury thermometer.

What is meant by absolute temperature, and how is the absolute zero determined?

2. State the experimental facts, and give the theoretical reasoning from them, by which it is proved that the pressure p of a given quantity of a perfect gas is inversely proportional to the volume v, and directly proportional to the absolute temperature t.

Determine the numerical value of $pv \div t$ for a pound of air, given that at 32° F. and a pressure of 2116.4 lbs. on the square foot, a cubic foot of air weighs .080728 lbs., that the expansion of the air under constant pressure is from 1 at 32° F to 1.366 at 212° F and that g=32.17 feet per second.

3. Describe the experiment from which Joule arrived at the conclusion that no appreciable change of temperature occurs when air is allowed to expand in such a way as not to do external work, and state the inferences that would result from this conclusion as to the constitution of atmospheric air.

Determine Joule's mechanical equivalent of heat from the data in Rider to No. 2 above, given in addition that the specific heats of air are as 1.404 to 1, and that the specific heat of air at constant pressure is .238 that of water.

[OVER.

4. Name the three primary colours. How can it be proved that yellow is a composite colour? How do you explain the colour of a mixture of a red powder with a green one?

A geranium petal both reflects and transmits red light; copper reflects red and (in the case of an extremely thin film) transmits blue. Explain the cause of this difference of action.

5. Explain the refraction of light *(a)* according to the emission theory, *(b)* according to the wave theory. What experiment decided between these theories?

A piece of glass immersed in water can easily be seen, not so the eyeball of an ox, with its outer coats removed. What inference can be drawn respecting the refractive indices of glass, water, and the eyeball?

6. Explain the difference between a compound microscope and a refracting telescope. (Make a drawing of each instrument, showing the lenses and the images).

A magnifying glass consists of two convex lenses, whose thickness, as also the distance between them, may be neglected. When used by a person who can see most distinctly at a distance of eight inches, the ratios of the magnifying powers of the first lens alone, the second lens alone, and the two combined, are 3:4:5. Find the focal lengths of the lenses.

7. Describe experiments from which it has been inferred that static electricity pervades the surfaces of conductors without penetrating into their interior. Is there any advantage respecting conducting power, in substituting a number of hollow copper rods for one solid rod of the same weight per foot as the hollow rods taken together?

Two small insulated spheres are charged, the one with twelve units of positive, the other with eight units of negative electricity and at a distance apart of four inches are found to attract each other with a force of 3. They are moved up to touch each other and are then removed to a distance of one inch apart. What will be the repulsive force at this distance apart, and in which stage of the experiment (the moving up, the touching, the removal) did the change from attraction to repulsion take place?

8. Describe the Grove cell. What are the advantages and what the disadvantages of the Grove, the Daniell, and the Bunsen batteries respectively?

Twenty exactly similar galvanic cells, each of which had an internal resistance of 8 Ohms, were joined up in series with an interpolar resistance of 1440 Ohms and produced a current of strength 25. What would be the strength of the current produced by 25 such cells through an interpolar resistance of 1800 Ohms?

9. Explain the Wheatstone Bridge method of measuring resistance. How is it applied to find the position of a fault in an otherwise well insulated cable immersed in a tank of water, both the ends being accessible?

A cable 18 miles long, whose ordinary conductive resistance was 162 Ohms, was found to have developed a fault. It was looped up with a perfect cable whose resistance was 219 Ohms, the two making the branches DC, CB, of a Wheatstone bridge ABCD, the galvanometer being in BD. AB and AD were made 60 Ohms each, and when 147 Ohms had been added to DC, the faulty cable branch, balance was obtained. Find the distance of the fault from D.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 34.)

NATURAL PHILOSOPHY.

TIME—THREE HOURS.

Examiner—J. C. GLASHAN.

N.B.—*Twenty-five marks to the first question,* 40 *marks to each of the others;* 225 *marks to count a full paper.*

1. (*a*) How are statical forces measured?
   (*b*) How can a statical force be represented by a circle?
   (*c*) In what respects can it be represented by a sphere?

2. Deduce the theory of the composition of forces from the Second Law of Motion.

Prove that if S be the centre of the circle circumscribing the triangle ABC, and P the point of intersection of the perpendiculars from the angles on the opposite sides, the resultant of forces represented by SA, SB, SC will be represented by SP.

3. Prove that if three forces be in equilibrium, the algebraic sum of their moments about any point in their plane will be zero.

A ladder 33 ft. long rests with one end on a smooth horizontal plane, the other end projecting 8 ft. over a smooth vertical wall 7 ft. high. The end on the plane is kept from slipping by a smooth vertical peg in the plane. Find the pressure on the plane, given that the weight of the ladder is 125 lbs, and that its centre of gravity is at 15 ft. from the lower end.

4. How are forces that produce motion measured?

A constant force F acting for one second on a mass of one oz. changes its velocity from 2 miles per hour to 32 miles per hour in the same direction; a constant force f acting for one minute on a mass of 1 lb. changes its velocity from 20 rods per second forward to 20 rods per second backwards. Compare the forces F and f.

[OVER.

5. How can the formulæ $mv=ft$, $2ms=ft^2$ be experimentally verified?

A body descending vertically draws an equal body 25 feet in $2\frac{1}{2}$ seconds, up a smooth plane inclined 30° to the horizon, by means of a string passing over a smooth pully at the top of the plane. Determine the force of gravity.

6. Define *energy*. How is it measured?

An iron ball weighing 10 lbs. falls from a height of 6 feet on to a floor which yields $\frac{1}{10}$ of an inch. Assuming the ball to be incompressible, determine the mean value of the force called into play during the compression of the floor.

7. Define the density of a substance, and prove that the numerical measure of the density is proportional to the cube of the unit of length and inversely proportional to the unit of mass.

A block of ice, the volume of which is a cubic yard, is observed to float with $\frac{2}{25}$ of its volume above the surface, and a small piece of granite is seen imbedded in the ice; find the volume of the stone, the *s.g.* of ice being .918 and that of granite 2.65.

8. How is the elasticity of a gas measured? Carbonic acid gas near the point of liquefaction decreases more and more rapidly in volume as the pressure regularly increases, the temperature remaining constant; hence prove that the elasticity is less than the pressure.

An imperfect barometer shows 5 inches of partial vacuum over 26 inches of mercury. It is sunk in a vessel of water till the surface of the mercury in the cup is 27 inches below the surface of the water. At what height will the mercury now stand, given *s.g.* of mercury=13.5, pressure of the air=30 inches of mercury, and assuming the elasticity of the vapour in the partial vacuum to be equal to the pressure?

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 35.)

SCHOOL LAW.

TIME—ONE HOUR AND A QUARTER.

Examiner—J. J. TILLEY,

Values.

14 1. What steps are to be taken in order that parts of two or more municipalities may be formed into one school section? What provision is made for the equalization of the assessment of such a section?

14 2. Give in full the powers vested (i.) in Township Councils, (ii.) in County Councils, to change the boundaries of school sections.

12 3. How are School Auditors appointed? What are their duties and powers?

12 4. For what monetary penalties may trustees become personally liable?

18 5. What is the law relating to the appointing of Arbitrators (i.) for selecting a school site, (ii.) for determining the value of a school site?

Give a summary of the general rules in regard to arbitrations.

12 6. What is the law relating to the granting of (i.) Third Class Certificates, (ii.) Second Class Certificates, (iii.) Special Certificates, (iv.) Renewed Third Class Certificates?

18 7. What is the law relating to

(i.) The borrowing of money by trustees,
(ii.) The payment of teachers' salaries,
(iii.) Providing an assistant teacher,
(iv.) Teachers' Associations,
(v.) Suspension and expulsion of children from school?

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 36.)

HISTORY.

TIME—THREE HOURS.

Examiner—S. ARTHUR MARLING, M.A.

1. "Greece has influenced the world for ever." Expand and illustrate this statement.

2. Show by examples how, in teaching, history and geography, and history and language, may be made to throw light upon each other.

3. Write historical explanatory notes on "the Basques," "Pagans," "Turanians," "Tyrants."

4. Describe after Freeman the origin of modern European nationalities.

5. What constitutional principles, previously doubted or undefined, was settled by the struggle of the English people against the Stuarts?

6. Give some account of the political writings of Milton, Hobbes and Locke, and show their influence on public events.

7. What is the difference between 'impeachment' and 'attainder'? Give examples of each.

8. Describe the domestic government of the Protectorate.

9. What part did John Pym, Lord Shaftesbury, and Sir W. Temple respectively take in public affairs?

10. Give a concise but full account of the reign of Charles II.

11. What were the chief benefits derived from the Revolution of 1688.

12. Name the chief causes of the greatness of France in the age of Louis XIV.

13. What causes led to the downfall of the Roman Republic?

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 37.)

CHEMISTRY.

TIME—TWO HOURS.

Examiner—J. A. McLELLAN, LL.D.

1. Describe the preparation of nitric acid, and explain the chemistry of the process. Give the reactions of dilute nitric acid with zinc.

2. How is chloride of lime prepared? What change does it undergo from exposure to the air? How is it applied in bleaching calico, and what is the chemical action in this case?

3. Describe the process for obtaining hydrogen, as represented in the following equation:—$3Fe + 4H_2O = Fe_3O_4 + 4H_2$; and explain the equation $NaCl + H_2SO_4 = HCl + NaHSO_4$.

4. (1) An analysis of a compound gave the following percentages:—Carbon, 20; oxygen, 26.67; sulphur, 53.33: calculate its formula.

   (2) A compound of iron and oxygen yielded the following percentages:—Iron, 70.01; oxygen, 29.99: determine its formula.

5. Represent by an equation the reactions in the following experiment:—Mix 32 grains of finely powdered manganese dioxide with an equal weight of common salt; pour upon the mixture 84 c.c. of oil of vitriol, diluted with 60 c.c. of water; heat the mixture gently.

6. Describe the preparation of iodine from potassium iodide, and explain the chemistry of the process. In what respects does iodine resemble bromine?

[OVER.

7. 100 grs. of an oxide of lead left, when reduced by a current of hydrogen, 90.65 grs. of metallic lead: deduce a formula for the oxide (Pb = 207).

8. What is the chemical composition of borax? Whence is it obtained, for what purpose is it used, and upon what chemical character does its use depend?

9. Give an outline of the process of extracting lead from galena. Explain how the silver is extracted from argentiferous lead. By what method can leaden pipes be protected from the corosive action of water? What is the nature of the change by which lead is converted into an earthy mass easily crumbling?

Write out in equations—

(1) Ammonium chloride and calcium hydrate give ammonia, calcium chloride, and water.

(2) Copper and nitric acid yield copper nitrate, nitric oxide, and water.

(3) Mercury and sulphuric acid yield mercuric sulphate, sulphurous anhydride and water.

Education Department. Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 38).

ALGEBRA.

TIME—THREE HOURS.

Examiner—J. A. McLELLAN, LL.D.

Values.

9 1. Simplify $\left(\sqrt{\frac{a+x}{x}}-\sqrt{\frac{x}{a+x}}\right)^2-\left(\sqrt{\frac{x}{a}}-\sqrt{\frac{a}{x}}\right)^2+\frac{x^2}{a(a+x)}$,

and

10 $$\frac{x^2-(y-z)^2}{(x+z)^2-y^2}+\frac{y^2-(z-x)^2}{(x+y)^2-z^2}+\frac{z^2-(x-y)^2}{(y+z)^2-x^2}.$$

8 2. Divide $\frac{x}{a}-1-\frac{b}{a}-\frac{6^2}{a^2}+\frac{b}{x}+\frac{b^2}{x^2}$ by $x-a$;

10 shew that $(-9a^2)^{\frac{1}{4}}=\frac{1}{2}(\sqrt{6a}+\sqrt{-6a})$.

24 3. If $\frac{m}{x}=\frac{n}{y}=\frac{r}{z}$ and $\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$,

prove that

$$\frac{m^2}{a^2}+\frac{n^2}{b^2}+\frac{r^2}{c^2}=\frac{m^2+n^2+r}{x^2+y^2+z^2}.$$

10 4. Find the relations between the roots and co-efficients of the equation $ax^2+bx+c=0$.

14 If m and n are the roots of the equation $ax^2+bx+c=0$, show that the roots of the equation $acx^2+(2ac-b^2)x+ac=0$ are $\frac{m}{n}$ and $\frac{n}{m}$.

[OVER.

Values.

5. Solve the equations:

8 (1) $x^2+2\sqrt{x^2-2x}=2x+8$

9 (2) $\frac{x^3}{y}-\frac{y^3}{x}=10\frac{5}{6}, \frac{x}{y}-\frac{y}{x}=\frac{5}{6}$

10 (3) $xz=y^2, x+y+z=12, x^2+y^2+z^2=91$.

16 6. Two men start at the same time to meet each other from towns which are 28 miles apart; one takes five minutes longer than the other to walk a mile, and they meet in four hours. Find each man's rate per hour.

14 7. If P, Q, R be respectively the pth, qth, rth terms of a G.P, shew that

$$P^{q-r}\times Q^{r-p}\times R^{p-q}=1.$$

14 Sum to infinity the series $\frac{1}{x}+\frac{2}{x^2}+\frac{3}{x^3}+$ &c.

10 8. Find the amount of $\$P$ at compound interest for n years, r being the interest on \$1 for one year.

12 Supposing $\$p$ to be withdrawn at the end of each year, what will be the amount at the end of n years?

10 9. Determine the number of combinations of n things taken r together.

12 The number of combinations of n things taken two together exceeds by 6 the number of combinations of $n-1$ things taken two together: find n.

14 10. (1) Find the limit of $(1+\frac{1}{x})^x$ when x increases without limit.

14 (2) Find the $(r+1)$th term in the expansion of $(3-5x)^{-\frac{1}{5}}$.

22 11. Determine the limits between which lies $\frac{x^2-3x-3}{2x^2+2x+1}$ for all possible values of x.

Education Department, Ontario.

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

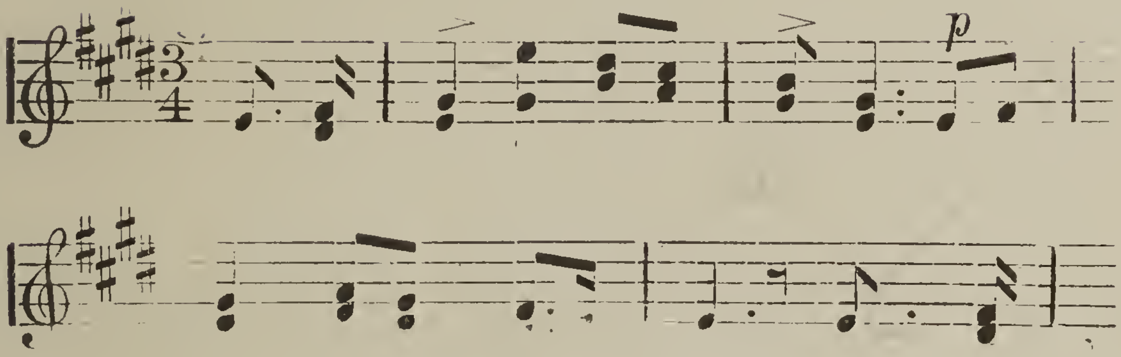
(No. 39.)

MUSIC.

TIME—ONE HOUR AND A QUARTER.

Examiner—JAMES HUGHES.

1.



(a) In what key is the above written?

(b) How many beats are there in a measure?

(c) On which beat should the singing begin?

(d) Explain the meaning of every mark except the *stave* and the *notes*.

(e) Name the notes as they occur according to their positions on the stave.

(f) Explain how the last measure is filled.

(g) Write down the explanations which you would give your class in finding the keynote of the piece.

(h) How would you find the proper pitch of the keynote?

2. Give examples of four kinds of *Thirds*.

3. What is an Accidental? What is the full effect of an Accidental?

4. What do you propose to do in the way of teaching Music in your school, and how do you intend to do it?

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JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 40.)

BOOK-KEEPING.

TIME--ONE HOUR AND A QUARTER.

Examiner—J. J. TILLEY.

The following entries are found in John Wilson's Day-Book :—

July 1st, 1877—Assets on beginning business are as follows : Cash in Bank, $2000 ; Cash in hand, $2500 ; store, house and lot, valued at $5000 ; wood, &c., for use in store, $80 ; a note against R. Smith, $800, dated January 1st, 1877, at nine months, and bearing interest at 8 % per annum. Liabilities are—A note in favour of John Burns for $900, dated April 1st, 1877, at six months, bearing interest at 8 %. A debt in favour of John Hicks, $400. July 2nd—Bought from R. Smith $2400 worth of mdse., giving in payment R. Smith's note with interest accrued ; an order on John Hick's, $400, and a cheque for balance. 4th—Shipped to Thomas Jones goods to the amount of $2000, to be sold on joint account, each one half, $1,500 from warehouse, balance bought from John Burns for cash ; paid, per cheque, freight, &c., $40 ; insurance, $20. 6th—Bought from A. Gibson, for cash, $1200 worth of mdse. On opening the goods on the 9th we found them damaged, and wrote informing Gibson of the fact. On the 12th we received a reply from Gibson stating he had made a reduction of 10 % on invoice price on account of damage to goods. 16th—Received advice from Thomas Jones of the sale of the goods sent him on the 4th, with cheque enclosed for $2500 for goods and one-half profits. 20th—Sold to John Hicks $400 worth of goods, receiving in payment an accepted draft on J. Lane for $80, a note against John Burns for $120, a note against John Hicks for $140, and a cheque for the balance.

[OVER.

Values.	
40	1. Give Wilson's Journal Entries for the above.
20	2. Make out a Statement of Losses and Gains. Mdse. on hand, $2100; wood, &c., $60.
20	3. Write out the account sales sent by Jones to Wilson on the 16th.
10	4. Give briefly the correspondence in reference to the damaged goods mentioned on the 9th and 12th.
10	5. Write out R. Smith's note making it non-negotiable. What change in the wording if made (i) negotiable by endorsement, (ii) negotiable without endorsement?

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JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 41.)

ENGLISH LITERATURE.

TIME—THREE HOURS.

Examiner—J. M. BUCHAN, M.A.

Values.

MACAULAY.

35 1. Reproduce Macaulay's discussion of the subject "What is meant by correctness in poetry."

2. "A reforming age is always fertile of impostors. The same excited state of public feeling which produced the great separation from the See of Rome, produced also the excesses of the Anabaptists. The same stir in the public mind of Europe which overthrew the abuses of the old French government produced the Jacobins and the Theophilanthropists. Macpherson and the Della Cruscans were to the true reformers of English poetry what Knipperdoling was to Luther, or what Clootz was to Turgot."

24, *i.e.* 4 × 6 (i.) Write brief explanatory notes on the Anabaptists, the Jacobins, the Theophilanthropists, Macpherson, Clootz, and Turgot.

5 (ii.) Who, according to Macaulay, were the "true reformers of English poetry?"

25 (iii.) State any facts which you know that tend to show that there is a connection between literary and other revolutions.

3. "It was in description and meditation that he [Byron] excelled."

6 Quote a passage in illustration of this statement.

[OVER.

Values.

GOLDSMITH.

4. Name and write brief notes on three other members
18, *i.e.* 6 × 3 of the literary club to which Goldsmith and Johnson
belonged.

5. "All evils here contaminate the mind,
That opulence departed leaves behind;
For wealth was theirs, not far removed the date,
When commerce proudly flourished through the state;
At her command the palace learnt to rise,
Again the long-fallen column sought the skies;
The canvas glowed beyond e'en nature warm,
The pregnant quarry teemed with human form;
Till more unsteady than the southern gale,
Commerce on other shores displayed her sail."
Goldsmith, The Traveller, ll. 131-140.

(i.) Of what nation is this a description? Give a
5 + 24 synopsis of the descriptions of other nations contained in
the Traveller.

(ii.) *For wealth was theirs, not far removed the date,*
5 etc. What caused the nation to lose its commercial prosperity? Write a brief note on the changes that have
20 taken place in the commercial leadership of the world from
the thirteenth century to the present time.

(iii.) *Again the long-fallen column sought the skies.*
6 Explain the force of this line, and especially that of
'again.'

BACON.

6. "Those that are first raised to nobility are commonly more virtuous, but less innocent, than their descendants; for there is rarely any rising but by a commixture of good and evil arts. But it is reason the memory of their virtues remain to their posterity and their faults die with themselves."—*Bacon, Of Nobility.*

(i.) Give an account of the life of Bacon, and discuss
35 the bearing of the facts which seem to show that he rose
"by a commixture of good and evil arts."

Values.

5 (ii.) Quote a passage from Shakespeare which expresses an opinion contrary to that expressed in the latter sentence here quoted.

7. Solomon saith, *There is no new thing upon the earth.* So that as Plato had an imagination that all knowledge was but remembrance, so Solomon giveth his sentence that all novelty is but oblivion. Whereby you may see that the river of Lethe runneth as well above ground as below. * * * * * * The great winding sheets that bury all things in oblivion are two—deluges and earthquakes. As for conflagrations and great droughts, they do not merely dispeople and destroy. Phaëton's car went but a day. And the three years' drought in the time of Elias was but particular and left people alive. As for the great burnings by lightnings which are often in the West Indies, they are but narrow. But in the other two destructions, by deluge and earthquake, it is further to be noted, that the remnant of people which hap to be reserved are commonly ignorant and mountainous people, that can give no account of the time past; so that the oblivion is all one as if none had been left. If you consider well of the people of the West Indies, it is very probable that they are a newer or a younger people than the people of the old world. And it is much more likely that the destruction that hath heretofore been there was not by earthquakes (as the Ægyptian priest told Solon concerning the island of Atlantis, that it was swallowed by an earthquake), but rather, that it was desolated by a particular deluge."—*Bacon, Of Vicissitude of Things.*

24, *i.e.* 4×6 (i.) Write explanatory notes on Plato, Lethe, Phaëton, Elias, Solon, Atlantis.

9, *i.e.* 3×3 (ii.) In what sense are the words 'merely,' 'particular,' and 'West Indies' used here.

10 (iii.) Where did the most civilized nations of Bacon's West Indies live, and what bearing has this fact on the argument of the passage?

SHAKESPEARE.

5 + 5 8. What are the dramatic unities? Which of them does Shakespeare observe?

[OVER.

Values.

9. MALCOLM: Comes the king forth, I pray you?
DOCTOR: Ay, sir: there are a crew of wretched souls
That stay his cure: their malady convinces
The great assay of art; but, at the touch,
Such sanctity hath heaven given his hand,
They presently amend.
MALCOLM: I thank you, doctor.
[*Exit Doctor.*]
MACDUFF: What's the disease he means?
MALCOLM: 'Tis called the evil;
A most miraculous work in this good king:
Which often, since my here-remain in England,
I have seen him do. How he solicits heaven,
Himself best knows: but strangely-visited people,
All swoln and ulcerous, pitiful to the eye,
The mere despair of surgery, he cures;
Hanging a golden stamp about their necks,
Put on with holy prayers; and 'tis spoken,
To the succeeding royalty he leaves
The healing benediction.
Macbeth, Act IV., Scene iii.

20, *i.e.* 5×4 (i.) Name the king, and give another name of the disease. To how late a period can you trace the practice of touching for the disease? With what political doctrine was the notion of the healing efficacy of a king's touch connected?

9, *i.e.* 3×3 (ii.) Explain the meaning of 'stay his cure,' 'convinces the great assay of art,' and 'succeeding royalty.'

5 (iii.) Write an explanatory note on 'golden stamp.'

Education Department, Ontario

JULY EXAMINATIONS, 1878.

FIRST CLASS TEACHERS.

(No. 42.)

DRAWING.

TIME—ONE HOUR AND A QUARTER.

Examiner—JAMES HUGHES.

1. What is meant by the term *fore-shortening*? Illustrate your answer by any object you choose.

2. Give instructions in full, as you would give them to a class, for drawing a water pitcher. Be especially particular about the *lip* and *handle.* Show your construction lines.

3. Sketch a doorway with the door half open.

4. Draw a long school room with desks on the floor, the spectator being at the end of the room. Show the sides and opposite end of the room.

5. Fill a circle two inches in diameter with any harmonious design, working outwards from the centre.

6. Give an original design for Carpets, Oilcloth, Lace, or Pottery, using any conventional leaf or flower form as the basis of the pattern.